Genetic Variation of the Lesser Peach Tree Borer, *Synanthedon pictipes* (Lepidoptera: Sesiidae) in Arkansas

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**ABSTRACT** The lesser peach tree borer, *Synanthedon pictipes* (LPTB), belongs to the economically important Lepidopteran family Sesiidae. No studies on genetic variation or population structure on the genus *Synanthedon* have been previously published. We examined DNA sequence variation in a 603 bp region of the mitochondrial cytochrome oxidase I gene (COI), tRNA-leu and cytochrome oxidase II gene (COII) from three LPTB populations in Arkansas. From 114 LPTB collected from three populations, a total of 53 nucleotide positions were polymorphic, and 12 distinct haplotypes were observed. The most frequent haplotype occurred in 88% of the sampled LPTB’s and in all three populations. Sequence divergence among haplotypes ranged from 0.2% to 8.8%. According to the standard molecular clock proposed for lepidopteran mtDNA, the haplotypes have been diverging for up to 2.5 million years. The greatest amount of haplotype diversity was observed in the Fayetteville population where borer management is not maintained. High levels of gene flow were observed among the Clarksville, Springdale and Fayetteville populations suggesting the LPTB has a broad dispersal range. Examination of the genealogical relationships and phylogenetic analysis of the 12 haplotypes supports the existence of three genetically distinct but morphologically indistinguishable subspecies.

**KEY WORDS** Genetic variation, mtDNA, Sesiidae, Lepidoptera

*Synanthedon pictipes* (Grote & Robinson) (Lepidoptera: Sesiidae), the lesser peach tree borer (LPTB), is native to North America, and was first reported in Pennsylvania in 1868. LPTB is found east of the Great Plains and north into Canada (Taft et al. 2004). The lesser peach tree borer larvae enter trees at the bark surface where previous injury has occurred (Smith 1951). The larvae feed mostly in the trunk above soil level and within branches (Smith 1951). The larvae will pupate the following spring. The number of generations per year varies by geographic location. More northern states such as New York and South Dakota experience only one generation of LPTB per year (Smith 1951, Gilbertson 1934). Southern states such as Texas, Arkansas, Virginia and Texas have two generations per year (King & Morris 1956, Bobb 1959, Girault 1907, Wong & Cleveland 1968).

Adult emergence of LPTB also varies with geographic location. Emergence is slightly later in more southern locations when compared to the northern locations. Ohio and South Dakota emergence occurs May through September with peak occurrence in June (King 1914, Gilbertson 1934). In Virginia, Georgia,

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